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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/529,908

12/16/2005

Takako Yamaguchi

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EXAMINER

FRASER, STEWART A

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/529,908	Applicant(s) YAMAGUCHI ET AL.	
	Examiner STEWART A. FRASER	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/29/2005 and 7/28/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This is the initial office action for US Application 10/529908 titled, "Method of Detecting Relative Position of Exposure Mask and Object to Be Exposed Alignment Method and Exposure Method Using the Same".
2. Claims 1-8 are currently pending and have been fully considered.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 6 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by YASUI et al. (US Patent 5,334,466).

The YASUI reference recites an X-ray mask that has alignment marks. With respect to claims 6 and 7, YASUI teaches (Column 7, Lines 40-61) a mask having a base, a membrane film consisting of SiN formed over the base, an absorber film of tungsten formed over the membrane film and alignment marks formed within the absorber film that overlays the surface of the membrane film. As shown by YASUI (Figures 1 and 2), the alignment marks (4) may be positioned at a central portion of the membrane film or around portions of the membrane film.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1-5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over YASUI et al. (US Patent 5,334,466) in view of KURODA et al. (US Patent 6,171,730) and SANGU (US Patent 6,252,649).

In view of claims 1, 2 and 8, the YASUI reference teaches (Column 7, Lines 40-61) a mask having a base, a membrane film consisting of SiN formed over the base, an absorber film of tungsten formed over the membrane film and alignment marks formed within the absorber film that overlays the surface of the membrane film. The YASUI reference does not appear to explicitly teach the limitations of claims 1 and 2 directed to flexing the membrane portion of the mask and detecting the relative position of the exposure mask or the limitations of claim 8 directed to an exposure apparatus.

However, the KURODA reference recites an exposure method and an exposure apparatus for performing a contact pattern transfer process. With respect to claims 1, 2 and 8, KURODA teaches (Claim 1) an exposure apparatus that is comprised of a contact means for bringing a first surface of the mask into substantially uniform contact with the object to be exposed by elastically deforming the mask. In further regard to claim 8, KURODA teaches (Claims 1-4) an

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exposure apparatus having an irradiation means for projecting a pattern onto an object to be exposed and a contact means for adjusting the pressure administered to an exposure mask. The KURODA reference does not appear to explicitly teach the limitations of claims 1, 2 and 8 directed to detecting the position of the exposure mask or the limitations recited in claim 8 directed to the driving devices of the exposure apparatus.

However, the SANGU reference recites an aligner device for aligning a mask and an object having a photosensitive layer. SANGU teaches (Claim 1) an aligner comprised of an aligning device for aligning a mask and an object having a photosensitive layer, a contacting device for contacting the aligned mask and object, a detecting device for detecting the alignment accuracy of the contacted mask and object, and a separating means that is responsive to the detecting device for separating the mask and the object from each other when the alignment accuracy of said contacted mask and object is detected by the detecting device to be out of a predetermined tolerance and in order to align the mask and the object again.

At the time of the invention, one of ordinary skill in the art would have been motivated to modify the teachings of YASUI by including the teachings of KURODA and SANGU in order to devise methods for detecting the position and performing an alignment of an exposure mask with an object to be patterned. As disclosed by SANGU (Column 1, Lines 19-25), position displacement may occur between an exposure mask and an object to be patterned and can result in a lack of pattern fidelity. By combining the teachings of the aforementioned references, one of ordinary skill in the art would be able to correct for mask misalignment during a contact exposure process. Therefore, the claims specified in the instant application would have been obvious at the time the invention was made.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEWART A. FRASER whose telephone number is (571)270-5126. The examiner can normally be reached on Monday to Thursday 6:30 am to 3:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F. Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark F. Huff/
Supervisory Patent Examiner, Art Unit 1795

/S. A. F./ Examiner, Art Unit 1795